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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JEFFREY E. HANNEMAN,
BRIAN WARN, and LEONARD J. QUADRACCI

Appeal 2016-007951[1]
Application 13/274,310[2]
Technology Center 2100

Before JEAN R. HOMERE, JASON V. MORGAN, and
MICHAEL M. BARRY, *Administrative Patent Judges*.

MORGAN, *Administrative Patent Judge*.

DECISION ON APPEAL

Introduction

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–20. Claims App'x. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] This Appeal is related to Appeal 2012-001068 (decided September 5, 2014) and Appeal 2016-006217 (decided July 26, 2017). App. Br. 1.
[2] Appellants identify The Boeing Company as the real party in interest. App. Br. 1.

Invention

Appellants invented a method of identifying possible future hostile activities including the use of historical data that has been collected and categorized as memory entities according to attacks and locations of attacks. Abstract. These memory entities are analyzed with an Associative Memory to identify correlations and discover new patterns. *Id.*

Representative Claim

Claim 1 is illustrated below:

> 1. A method comprising discovering new patterns in historical data that predict future hostile activities in high threat environments, including:
>
> collecting the historical data in computer-readable memory as memory entities, the memory entities categorized according to types of attacks and locations of attacks, the memory entities containing attributes taken from the pieces of historical data;
>
> using a computer system to analyze the memory entities with heteroassociative memory, wherein correlations of the attributes of the different memory entities are identified; and
>
> discovering the new patterns from the correlations.

Rejections

The Examiner rejects claims 1, 11, and 12 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Final Act. 10–11.

The Examiner rejects claims 1–3 and 5–10 under 35 U.S.C. § 103(a) as being unpatentable over Aparicio, IV et al. (US 2008/0306944 A1; published Dec. 11, 2008) ("Aparicio '944"), Jan Jelinek and Datta Godbole, *Model Predictive Control of Military Operations*, Proceedings of the 39th IEEE Conference on Decision and Control, 2562–67 (Dec. 2000)

("Jelinek"), and Aparicio, IV et al. (US 6,581,049 B1; issued June 17, 2003) ("Aparicio '049"). Final Act. 13–19.

The Examiner rejects claims 11–14, 16, and 18–20 under 35 U.S.C. § 103(a) as being unpatentable over Aparicio '944 and Jelinek. Final Act. 19–28.

The Examiner rejects claims 4 and 17 under 35 U.S.C. § 103(a) as being unpatentable over Aparicio '944, Jelinek, Aparicio '049, and Cox et al. (US 2003/0225749 A1; Dec. 4, 2003) ("Cox"). Final Act. 28–29.

The Examiner rejects claim 15 under 35 U.S.C. § 103(a) as being unpatentable over Aparicio '944 and Jelinek. Final Act. 29–30.

ANALYSIS

We agree with and adopt as our own the Examiner's findings of facts and conclusions as set forth in the Answer and in the Action from which this appeal was taken. We have considered Appellants' arguments, but do not find them persuasive of error. We provide the following explanation for emphasis.

35 U.S.C. § 101—Claims 1, 11, and 12

Patent eligibility is a question of law that is reviewable *de novo*. *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1333 (Fed. Cir. 2012). To be statutorily patentable, the subject matter of an invention must be a "new and useful process, machine, manufacture, or composition of matter, or [a] new and useful improvement thereof." 35 U.S.C. § 101. There are implicit exceptions to the categories of patentable subject matter identified in § 101, including: (1) laws of nature; (2) natural phenomena; and (3) abstract ideas. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S.Ct. 2347, 2355 (2014). The Supreme Court has set forth a framework for distinguishing patents with

claims directed to these implicit exceptions "from those that claim patent-eligible applications of those concepts." *Id.* (citing *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 132 S.Ct. 1289 (2012)). The evaluation follows a two-part analysis: (1) determine whether the claim is directed to a patent-ineligible concept, e.g., an abstract idea; and (2) if a patent-ineligible concept is present in the claim, determine whether any element, or combination of elements, in the claim is sufficient to ensure that the claim amounts to significantly more than the patent-ineligible concept itself. *See Alice*, 134 S.Ct. at 2355.

In rejecting claims 1, 11, and 12, under 35 U.S.C. § 101, the Examiner concludes the claims are directed to the abstract concept of "organizing information through mathematical correlations." Final Act. 10. The Examiner finds that the additional elements in the claim are merely "well-understood, routine and conventional activities previously known to the industry, specified at a high level of generality" that merely recite the use of "a generic computer to perform generic computer functions" to carry out the abstract concept, and thus do not "qualify as 'significantly more'" than the underlying abstract concept. *Id.*

Appellants contend the Examiner erred because the claims not only "recite the use of a tool called Associative Memory on specific data structures containing specific information . . . . The claims further recite using the resulting correlations to discover new patterns [that] are extremely significant and useful for military operations." App. Br. 20; *see also* Reply Br. 1 ("[T]he claims expressly recite certain memory devices (associative memory and heteroassociative memory.").

Appellants' arguments are unpersuasive. Claims 1, 11, and 12 are directed to the abstract ideas of using associative or hetreoassociative memories to discover patterns. *See* Final Act. 10–11; *see also Ex parte Hanneman*, App. No. 2016-006217, slip op at *4, available at https://e-foia.uspto.gov/Foia/RetrievePdf?system=BPAI&flNm=fd2016006217-07-24-2017-1 (PTAB July 26, 2017) (non-precedential) (Claims not shown to be "directed to something other than or significantly more than the abstract idea of using Associative Memory to predict events such as a mission outcome" directed to nonstatutory subject matter.).

Appellants argue that "[t]he discovered patterns . . . can prevent death and destruction in hostile environments." App. Br. 20. However, utility alone is insufficient to transform an abstract idea from non-statutory to statutory subject matter. Claims directed to applying risk hedging concepts to energy markets (*Bilski v. Kappos*, 561 U.S. 593, 609 (2010)), to helping doctors adjust thiopurine drug dosage when treating patients with autoimmune diseases (*Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 72 (2012)), and to mitigating settlement risk through intermediated settlement (*Alice Corp.*, 134 S.Ct. at 2352) were all useful. But, they were also not directed to statutory subject matter. Therefore, we agree with the Examiner that claims 1, 11, and 12 are directed to an abstract idea.

Appellants argue the Examiner ignores claimed physical devices in concluding claims 1, 11, and 12 do not recite something "significantly more" than the underlying abstract idea. *See* Reply Br. 1–3. Appellants also argue the Examiner fails to identify "the overall function performed in [each] claim and analyz[e] whether the overall result is not merely generic." Reply

Br. 2. However, while the claims recite computer-readable, associative, and heteroassociative memories, a computer system, and data and analysis module, these components are claimed and described in the Specification with broad, general terms, rather than specific language characterizing these recitations as particular devices or even as general purpose devices modified using particular algorithms. *See, e.g.*, Spec. ¶¶ 35–37 (describing the concepts of heteroassociative and autoassociative memories), 53 ("[t]he hardware may range from a single laptop computer to a server system to [a] cluster of distributed computers . . . . Each module may include a combination of hardware and software"); *see also Hanneman*, at *4–5 (Autoassociative memory described in the Specification as an abstract concept failed "to add anything significantly more to the abstract idea of using an Autoassociative Memory."). Because of their lack of claimed or described specificity, we agree with the Examiner that the claimed generic computer components "merely provide [for a] conventional computer implementation" of the underlying abstract idea. Ans. 5; *see also* Final Act. 10. Therefore, we agree with the Examiner that claims 1, 11, and 12 do not recite anything "significantly more" than the underlying abstract idea.

For these reasons, we agree with the Examiner that claims 1, 11, and 12 are directed to non-statutory subject matter. Accordingly, we sustain the Examiner's 35 U.S.C. § 101 rejection of these claims.

35 U.S.C. § 103(a)—Claims 1–6, 9, and 10

In rejecting claim 1 under 35 U.S.C. § 103(a), the Examiner finds that Aparicio '944 teaches, suggests, or otherwise renders obvious: (1) collecting historical data as memory entities (e.g., using source data such as source documents to obtain a plurality of entities that each include "a person,

place or thing for which an analogy is to be detected") (Final Act. 13 (quoting Aparicio '944 ¶ 37)); (2) categorizing the memory entities into different classes (e.g., persons or places) (Final Act. 14 (citing Aparicio '944 ¶ 52)); (3) analyzing the memory entities with heteroassociative memory to identify correlations (Final Act. 15 (citing Aparicio '944 ¶¶ 37, 52, 58, and Fig. 9; Aparicio '049 col. 15, ll. 11–23)); and (4) discovering new patterns from the correlations (Final Act. 16 (citing Aparicio ¶ 57, Fig. 8)). The Examiner relies on Jelinek's use of a predictive control framework in a military context to render obvious "**the memory entities [being] categories according to types of attacks and locations of attacks, the memory entities containing attributes taken from the pieces of historical data**." Final Act. 14 (citing Jelinek 2563).

Appellants contend the Examiner erred because although Aparicio '944 "describes the inner workings of associative memory," "[i]t does not describe the type of data recited in claim 1." App. Br. 9; *see also id.* at 11 ("The associative signature is a subset of a larger set of observed entities, not a pattern than can predict future hostile activities in high threat environments."). However, the Examiner relied on Jelinek, not Aparicio '944, for the application of the predictive teachings of Aparicio '944 to predict "future hostile activities in high threat environment[s]." Ans. 12. Appellants argue that Jelinek "does not rely on associative memory or the discovery of new patterns" to determine mission outcomes. App. Br. 13. However, the Examiner relies on Aparicio '944 in combination with Aparicio '049, rather than on Jelinek, to render obvious the claimed approach to discovering new patterns. *See* Final Act. 13–16.

Appellants argue Aparicio '944 does not render obvious "the claimed categorizing" because Aparicio '944 obtains associative counts "by operation of the heteroassociative memory" rather than collecting and organizing (i.e., categorizing) data "BEFORE heteroassociative memory is even used." App. Br. 9–10. However, Appellants do not persuasively rebut the Examiner's finding that the use of entity memory 510 in Aparicio '944 to generate associative signatures that are used for associative lookups renders obvious the claimed use of categorized memory entities. Ans. 6–10 (citing, e.g., Aparicio '944 ¶ 55). Appellants also argue the signature in Aparicio '944 "can describe only [the] most informative observed entities rather than a complete set of observed entities." App Br. 11. However, Appellants do not persuasively explain how the scope of what a signature describes distinguishes the claimed invention from the teachings and suggestions of the prior art.

Appellants argue the Examiner's findings do not show that "it is obvious to modify Aparicio '944 to produce a method having all of the features of claim 1" and that the Examiner "only considers the differences." App. Br. 12. However, the Examiner has set forth sufficient findings showing that it would have been obvious to an artisan of ordinary skill to apply the teachings and suggestions of Aparicio '944 to analyze the specific types of historical data identified in Jelinek and make predictions therefrom. *See* Final Act. 15; Ans. 12. In particular, the Examiner finds, without persuasive rebuttal, that Jelinek's teachings and suggestions regarding analysis of data for a high threat environment render obvious modifying Aparicio '944 to analyze similar high threat environment data. *See* Ans. 12.

For these reasons, we are not persuaded of error in the Examiner's conclusion that the combination of Aparicio '944, Jelinek, and Aparicio '049 renders obvious the disputed recitations of claim 1. Accordingly, we sustain the Examiner's 35 U.S.C. § 103(a) rejection of claim 1, and claims 2, 3, 5, 6, 9, and 10, which Appellants do not argue separately. App. Br. 9. Appellants do not raise additional issues with respect to the Examiner's 35 U.S.C. § 103(a) rejections of claim 4. Therefore, we also sustain the Examiner's 35 U.S.C. § 103(a) rejections of claim 4.

35 U.S.C. § 103(a)—Claims 7 and 14

In rejecting claim 7 under 35 U.S.C. § 103(a), the Examiner finds Jelinek's teaching of providing a corrective action to a commander renders obvious *making the new patterns accessible to allow third parties to make predictions about future hostile activities by hostile forces*. Final Act. 18 (citing Jelinek 2563). The Examiner further notes that the recited reason for making new patterns accessible to third parties represents an intended use that does not limit the scope of the claimed invention (i.e., it is sufficient that the prior art renders obvious making new patterns accessible to third parties). *See* Ans. 13.

Appellants contend the Examiner erred because "Aparicio '944 does not teach or suggest making a plurality of associative signatures accessible to third parties" while Jelinek "does not suggest sending an associative signature to a third party." App. Br. 13. However, the Examiner relies on Aparicio '944, in combination with Aparicio '049, not Jelinek, to render obvious the claimed method of collecting and analyzing data to discover new patterns. *See* Final Act. 13–16. The Examiner properly relies on Jelinek's teachings to show that it would have been obvious to make

accessible the resulting data (i.e., the new patterns) to a third party (e.g., a commander). *See* Final Act. 18. Appellants' contention that the Examiner merely provides a "conclusory statement of obviousness" (App. Br. 14) is unpersuasive given that making data accessible to a party that can put that data to use has long been a known use of data.

Accordingly, we sustain the Examiner's 35 U.S.C. § 103(a) rejection of claim 7. Appellants make similar arguments with respect to claim 14 (App. Br. 17), which are unpersuasive for the reasons discussed above. As discussed below, Appellants' arguments with respect to claim 12, from which claim 14 depends, are unpersuasive. Therefore, we also sustain the Examiner's 35 U.S.C. § 103(a) rejection of claim 14.

35 U.S.C. § 103(a)—Claims 8 and 18.

In rejecting claim 8 under 35 U.S.C. § 103(a), the Examiner finds Jelinek, by teaching that a "commander receives the prediction that the mission will succeed given a particular strike package, and where the model predictive controller . . . is useable for a plurality of commanders," renders obvious modifying the combination of Aparicio '944, Aparicio '049, and Jelinek to include *applying the new patterns to current data to predict future hostile activities during a mission given a set of mission attributes*. Final Act. 19 (citing Jelinek 2563); *see also* Ans. 14–15.

Appellants contend the Examiner erred because "claim 8 doesn't recite sending a prediction. It recites applying a plurality of new patterns to current data in order to make a prediction." App. Br. 14. That is, Appellants argue that Jelinek applies the new patterns, without making them accessible to a third party, and then provides predictions to the third party. However, the claimed invention merely recites "making the new patterns *accessible* to

allow third parties to make predictions" (claim 7, from which claim 8 depends; emphasis added) and "after the new patterns have been made *accessible*, applying the new patterns to current data to" make predictions. App. Br. 23 (Claims App'x) (emphasis added). Merely making new patterns accessible for use and application does not distinguish from Jelinek's teaching of allowing a plurality of commanders to use a predictive controller to make predictions. Final Act. 19 (citing Jelinek 2563).

Neither the claim nor the Specification limits or describes the term "accessible" so as to preclude providing access to patterns by allowing them to be used to obtain predictions. The Specification, in fact, discloses that one way to make patterns accessible to other parties is by preloading computers with the patterns, providing the computers to the other parties (e.g., front line forces), and operating those computers to obtain current data, apply the patterns to the current data, and issue alerts. Spec. ¶ 47. That is, rather than provide the patterns themselves to such parties, the computers make the patterns accessible by providing the parties with predictions. Thus, the Specification details a way of making discovered patterns accessible that accords with Appellants' characterization of the prior art. *See* App. Br. 14.

For these reasons, we agree with the Examiner that the combination of Aparicio '944, Aparicio '049, and Jelinek renders obvious "after the new patterns have been made accessible, applying the new patterns to current data to predict future hostile activities during a mission given a set of mission attributes," as recited in claim 8.

Accordingly, we sustain the Examiner's 35 U.S.C. § 103(a) rejection of claim 8. Appellants make similar arguments with respect to claim 18 (App. Br. 17–18), which are unpersuasive for the reasons discussed above.

As discussed below, Appellants' arguments with respect to claim 12, from which claim 18 depends, are unpersuasive. Therefore, we also sustain the Examiner's 35 U.S.C. § 103(a) rejection of claim 18.

35 U.S.C. § 103(a)—Claim 11

In rejecting claim 11 under 35 U.S.C. § 103(a), the Examiner finds Aparicio '944—by using a list of best observed entities and best associations to provide a distinct nonlinear description of the observer entity as a function of surrounding coincidences and by obtaining similarity information—teaches, suggests, or otherwise renders obvious *discovering new patterns that predict future activities associated with attacks, including grouping the attributes according to the strength and the correlations, and analyzing the grouped attributes to determine what each of the patterns actually represents*, when combined with Jelinek. Final Act. 22–23 (citing Aparicio '944 ¶¶ 57, 65, and Figs. 7, 8, 12). Appellants contend the arguments made with respect to the rejection of claim 1 are also applicable to the rejection of claim 11. App. Br. 18. For the reasons discussed above, we do not find these arguments persuasive of error.

Appellants further contend the Examiner erred because the cited teachings of Aparicio '944 "all describe activity performed within associative memory," "the discovery of new patterns is beyond the capability of the associative memory," and "associative memory does not determine what the patterns actually represent." *Id.* Appellants also argue the Examiner relies on teachings in Aparicio '944 that describe "the accumulation of analog information to determine similarity measures between entities [rather than] post-processing of an associative signature." *Id.* at 19. However, claim 11 does not preclude the disputed steps being

performed within an associative memory. Moreover, Appellants do not provide persuasive evidence as to the limits of what the associative memory in Aparicio '944 is capable of performing. Because Appellants' arguments are incommensurate with the scope of the claimed invention or unsupported by persuasive evidence, we do not find Appellants' arguments persuasive of error.

Accordingly, we sustain the Examiner's 35 U.S.C. § 103(a) rejection of claim 11.

35 U.S.C. § 103(a)—Claims 12, 13, 15–17, 19, and 20

In rejecting claim 12 under 35 U.S.C. § 103(a), the Examiner relies on Aparicio '944 to teach, suggest, or otherwise render obvious recitations directed to: (1) *a data collection module for receiving intelligence reports* and *storing the reports in computer-readable memory as memory entities* and (2) *an analysis module for analyzing memory entities and discovering new patterns from identified correlations*. Final Act. 23–26 (citing, e.g., Aparicio ¶¶ 40, 50, 52, and 57–58). The Examiner relies on Jelinek to render obvious the received intelligence reports being *about a geographic region of interest* and categorizing the memory entities *according to types of attacks and locations of attacks*. Final Act. 23–24 (citing Jelinek 2563). Appellants contend the arguments made with respect to the rejection of claim 1 are also applicable to the rejection of claim 12. App. Br. 15–17. For the reasons discussed above, we do not find these arguments persuasive of error.

Appellants further contend the Examiner erred because Aparicio '944 "is silent about intelligence reports [and] only refers to source data 130." *Id.* However, Appellants do not explain what distinguishes an "intelligence

report" from source data used as the basis for a plurality of entities. Aparicio ¶ 40. Moreover, the Examiner's reliance on Jelinek, which teaches use of the type of information one would expect could be available in intelligence reports (e.g., lethality of surface-to-air missiles held by an opposing force, composition of opponent's real and decoy assets, etc.), further supports the Examiner's conclusion that the combined teachings and suggestions of Aparicio '944 and Jelinek renders obvious collecting data from intelligence reports. *See* Jelinek 2563.

Appellants further argue that "Jelinek does not suggest storing intelligence reports about a geographic region of interest in computer-readable memory as memory entities." App. Br. 16. Specifically, Appellants argue "Jelinek's approach toward predicting a mission outcome does not rely on memory entities [in] an associative memory." App. Br. 16. However, the Examiner relies on Aparicio '944, not Jelinek, to teach, suggest, or otherwise render obvious the particular data collection and analysis modules recited in claim 12. *See* Final Act. 23–26. The Examiner cites to Jelinek to show that it would have been obvious to an artisan of ordinary skill to apply these modules in a domain pertaining to intelligence reports about a *geographic region of interest* that can be *categorized according to types of attacks and locations of attacks*. *See id.* at 23–24.

Because the Examiner relies on the combined teachings and suggestions of Aparicio '944 and Jelinek, but Appellants merely attack the references individually, we do not find Appellants' arguments persuasive of error. Accordingly, we sustain the Examiner's 35 U.S.C. § 103(a) rejection of claim 12, and claims 13, 15, 16, 19, and 20, which Appellants do not argue separately. *See* App. Br. 15. Appellants do not raise any additional

issues with respect to the Examiner's 35 U.S.C. § 103(a) rejection of claim 17. Therefore, we also sustain the Examiner's 35 U.S.C. § 103(a) rejection of claim 17.

DECISION

We affirm the Examiner's decision rejecting claims 1–20.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 41.50(f).

AFFIRMED